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To: Delta Protection Commission

From: Margit Aramburu, Executive Director

Subject: Report on Estimated Water Levels in Delta Waterways

Background:

California's water picture changed dramatically this rainfall year. The State went from a decade of low rainfall years, with the exception of 1993, to a well above average rainfall year. Precipitation (as of January 26) at Shasta Dam was 149% of normal, at Blue Canyon 191% of normal, and at Yosemite 145% of normal.

The large amount of water is being managed by the State's dam and water project managers to provide flood control and water storage for future use. There is a large amount of snow in the Sierra Nevada mountains which will melt during the Spring and Summer and add to the amount of water available for storage or for outflow.

River Stage Data:

On a leveed waterway, DWR's Flood Emergency Operations Manual states there are three stages:

1. **Warning Stage:** The stage at which patrol of flood control project levees becomes mandatory, or the stage at which flow occurs into bypass areas from project overflow weirs.

2. **Project Flood Stage:** The stage at which the flow in a flood control project is at maximum design capacity. At this level there is a minimum freeboard of three feet to the top of levees.

3. **Danger Stage:** The stage at which the flow in a flood control project is greater than maximum design capacity

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and where there is extreme danger with threat of significant hazard to life and property in the event of levee failure. This is generally one foot above project flood stage.

For Sacramento River at I Street Bridge, the stages are:

Warning:	25 ft
Project Flood Stage:	31 ft
Danger Stage:	32 ft
Top of Levee:	34 ft
Peak Stage of Record:	30.7 (2/19/86)

For Rio Vista at the Bridge, the stages are:

Warning:	8 ft
Project Flood Stage:	12.5 ft
Danger Stage:	13.5 ft
Top of Levee:	22
Peak Stage of Record:	11.5 (2/20/86)

For Mokelumne River near Thornton at Benson's Ferry, the stages are:

Warning:	13 ft
Flood:	18 ft
Peak Stage of Record:	21.32 (2/18/86)

For San Joaquin River at Mossdale Bridge, the stages are:

Warning:	17 ft
Project Flood Stage:	26.2 ft
Danger Stage:	27.2 ft
Top of Levee:	30.7
Peak Stage of Record:	24.4 (12/10/50)

Current Water Levels:

Current reports (River News Herald, March 29, 1995) state the water depth in the channels is now six inches to a foot below the levels of 1986 when levee breaks flooded several thousand acres. These high water levels are affecting the burrowing mammals, such as beavers and muskrats, which have been flooded out of their dens and are actively creating or cleaning out secondary dens.

Current pressure spots are in the Walnut Grove-Thornton area, where the Cosumnes and Mokelumne Rivers join the Sacramento River, and along Venice Island, Rindge Tract, and Whiskey Slough.

As of mid-April, the elevation at Mossdale Bridge was 13.6 feet (3.5 feet below warning level). At I Street Bridge, the elevation was 20 feet (5 feet below warning level).

Normal Water Elevation:

Normal elevation in May at Mossdale Bridge (based on the records from 1924 to 1993) would be 5 to 6 feet. Normal elevation in May at I Street Bridge (based on the records from 1949 to 1993) would be 8 feet.

Impacts Associated with Snowmelt:

The Sacramento River system carries most of the State's rainfall. The system should have no problem carrying the spring/summer runoff. About two-thirds of the Basin's runoff comes from rainfall and only about 35% from snowmelt.

The San Joaquin River system is smaller. The channels are about a tenth as big as those of the Sacramento. In the San Joaquin Basin, snowmelt contributes about 65% to the annual runoff, and rain about 35%. The flood season stretches from April through June. For example, at Mossdale on the San Joaquin River, in late March the River was still at warning level, while the Sacramento River had dropped to 21 feet, well below the 25 foot warning elevation.

Impacts on Recreational Use:

On March 27, 1995, the Department of Boating and Waterways issued a boating safety advisory due to hazards resulting from high water levels on rivers, lakes, and reservoirs. The advisory suggests keeping boat speeds down. A 1993 marine insurance study found that 49% of all accidents were caused by collision with a submerged object. The waterways are also carrying large pieces of debris, such as logs and branches. Currents are stronger in some places. Overhanging tree limbs are closer to the water surface.

Local experts, such as Jay Sorensen who writes a fishing column for the River Herald and other papers, also suggests staying off the water during high water flow levels because of the floating "debris and flotsam hazardous to your vessel" (March 29, 1995).

Impacts on Levees:

One of the three main causes of levee failure during periods of high water is overtopping from water surface elevations higher than the levee. Levees in the Delta are much lower than the levees which protect the urbanized areas of Sacramento, West Sacramento, Stockton, and others. When waterway

surface elevations are high, there is the possibility of wavewash. Wavewash (waves washing over the top of a levee) can be caused by high winds and by vessel wakes.

Possible Actions:

1. The Commission could formally request the Coast Guard to limit the speed of commercial ships and/or recreational vessels in the deep water channels during periods of high water when wavewash could adversely affect levees.

2. The Commission could request that recreational boaters (through communication with boating organizations, yacht clubs, and marinas) voluntarily travel at 5 mph during those periods of high water when wavewash could adversely affect levees. This would also affect boating activities such as water skiing and riding personal watercraft.

3. The Commission could ask Sheriff and City marine patrols to use best judgement in asking boaters to slow to speeds that will not create erosive wakes during periods of high water and would promote boating safety associated with striking hidden obstacles and floating debris.

Sources:

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Boating and Waterways Press Release, March 29, 1995.

James Bailey, Flood Operations Center, DWR, March 29, 1995.

Stockton Record, "Counties OK's for Disaster Relief", March 29, 1995.

Coast Guard, Rio Vista and Alameda, March 29, 1995.

River News-Herald and Isleton Journal, "Delta Levee Water Concerns Growing", March 29, 1995.

Sorensen, Jay, "Lets Go Fishing", March 29, 1995.

Stockton Record, "Flood Operations Center", March 26, 1995.

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DWR, Flood Emergency Operations Manual, September 1994.

Sacramento Bee, "Bank On It: Snow to Stay", March 26, 1995.